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Aviation Week

Including Space Technology

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Aircraft
Space Vehicles
& Missiles

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Including Space Technology

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The 1960 *Airline Week Buyers' Guide* was compiled with the cooperation of more than 3,500 representatives of the aircraft and associated industries in the United States and Canada. It is intended to serve as a standard reference on procurement and sales in the airline industry.

75,473 copies of this issue printed

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How to Use the 1960 Buyers' Guide

The fifth Aviation Week Buyers' Guide issue includes listing of Canadian firms serving the aircraft industry. You will find these companies listed separately in the Manufacturers' and Distributors' Indexes, but integrated alphabetically with U.S. firms in the product listings.

SECTIONIZED FORMAT . . .

The Guide divides its manufactured products listing into five separate sections of related interest. This is done for convenience in finding any particular product or service.

IF YOU ARE BUYING . . .

Refer to the alphabetical product index which follows to find the page number of each specific product with its manufacturers. Types of one product appear in subindex under the pertinent product heading, and are indicated after each manufacturer's address.

IF YOU ARE SELLING . . .

You will find the names of the buyers of complete systems and components for the military services between pages 32 and 44, and for the commercial airlines on page 301.

MANUFACTURERS AND DISTRIBUTORS . . .

An alphabetical listing of manufacturers whose products are featured in this Guide begins on page 17. A similar listing of distributors serving the aircraft industry begins on page 376.

HOW TO USE LISTINGS . . .

Advertisers in the Guide are boldfaced in the Manufacturers' Index, the Distributors' Index and in the Product Listings, and page numbers of these advertisements are shown.

ADVERTISED PRODUCTS . . .

An index of advertisements, with page numbers of their ads, begins on page 372. A special index of advertised products beginning on page 31 will help you to obtain complete information on products quickly and easily by referring to the advertising pages.

REAR SERVICE . . .

Further information on all products advertised in the Guide is quickly available. Use the convenient postpaid card inserts, placed throughout the book, which are keyed to advertisements.

SECTIONS OF GUIDE

A1 AIRCRAFT. This section lists products that are installed either complete or as major systems in all airplane, helicopter, major components, such complete units as seats or control assemblies are to be found herein.

B1 MISSILES, SPACE VEHICLES AND COMPOSITE. Listings are similar to those in Section A, but are applicable specifically to missiles, space-related supporting equipment as also listed, but common support items are not included here.

C1 AVIONICS. The specialized equipment listings in this section include all the common parts—radars, transmitters, switches and displays—plus the large radars and gun sights, fire-control systems and specialized units that extend men's knowledge and control of a weapon.

D1 SUPPORT EQUIPMENT AND SERVICES. The numerous accessories of the kind of support of a weapon system is recognized by setting these items apart in a category of their own, including all the hardware items, factories, raw materials and services that go into support functions.

E1 AIRLINE AND AIRPORT EQUIPMENT. In this section are listed the hundreds of companies, small and large, that sell transportation of people or cargo, the manufacturers of large fixed items like hangars and runways and lighting systems, and services of airport contractors.

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t. Optical	356	Teles, Truck	356	Turbomachinery	356
Test Equipment, Atomic	356	Teles, Truck	356	Turbomachinery	356
Test Stand Equipment	356	Teles, Truck	356	Turbomachinery	356
Testing, Environmental	356	Teles, Truck	356	Turbomachinery	356
Testbeds, Test Bed, Models	356	Teles, Truck	356	Turbomachinery	356
Thermistors, Bulb	356	Teles, Truck	356	Turbomachinery	356
Thermistors	356	Teles, Truck	356	Turbomachinery	356
Thermocouples	356	Teles, Truck	356	Turbomachinery	356
Thermocouples, Cable & Cable	356	Teles, Truck	356	Turbomachinery	356
Thermocouples	356	Teles, Truck	356	Turbomachinery	356
a. Air System	356	Teles, Truck	356	Turbomachinery	356
b. Electric	356	Teles, Truck	356	Turbomachinery	356
c. Liquid System	356	Teles, Truck	356	Turbomachinery	356
a. Mechanical	356	Teles, Truck	356	Turbomachinery	356
b. Fuel Flow	356	Teles, Truck	356	Turbomachinery	356
c. Fuel Pressure	356	Teles, Truck	356	Turbomachinery	356
d. Fuel Quantity	356	Teles, Truck	356	Turbomachinery	356
e. HE	356	Teles, Truck	356	Turbomachinery	356
a. Hydraulic Pressure	356	Teles, Truck	356	Turbomachinery	356
b. Loading Gun Position	356	Teles, Truck	356	Turbomachinery	356
c. Mirrors	356	Teles, Truck	356	Turbomachinery</	

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Y Y Z

Walter's Concessions 41 16 34th St., Long Island City 1, N. Y.
Yoko & Yoko Mfg. Co., 12015 Roosevelt Blvd., Mdt. Heights 10, Mo.
Yonkers Sporting Shop, 401 So. Leonard St., New York 13, N. Y.
Zachary's Men's Wear, 1700 Broadway, 10018 Limited Plaza, New York 10, N. Y.
Zach's Fashion Company, 301 W. Wisconsin Bldg. & Wly. Co., 1411 W. 118th St., P. O. Box 47, Omaha 68110, Neb.
Zee Bros., 221 South St., El Segundo 169, Calif.
Zengling Co., 100, 701 S. San Pedro St., Los Angeles 12, Calif.
Zim Industries, Inc., Mechanical Power Transmission Div., 14015 Alhambra Avenue, Glendale, Pa.

Canadian Manufacturers

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National,
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D. Lattini.
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and.L. Goto
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Toronto 24.

Index of Products Advertised

A special service designed to provide readers with quick guide to the product information contained in advertisements throughout this Buyers' Guide.

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General Procurement Policies of DOD Agencies

Methods of Purchase

Purchases are made either by formal advertising or, under certain specified conditions, by negotiated procedures. A date and hour for bid opening is set in advance, and bids are publicly opened and recorded at that time. Award is made to the responsible bidder whose bid, conforming to the Invitation for Bids, is most advantageous to the Government, price and other factors considered. Upon award, this accepted bid becomes a legally binding contract.

To provide a method of procurement for the armed services where formal advertising does not meet their needs, the Armed Services Procurement Act sets forth conditions governing procurement by negotiation. The experienced, developmental or research nature of the item, the urgency of the requirement, the interest of national defense or industrial mobilization or other considerations covered by these conditions may require the contracting officer to select this method. The use of the negotiation method does not by any means preclude competition. It is the policy of the Department of Defense under negotiated procurement to ensure full and free competition, consistent with the requirements of the procurement by obtaining proposals from qualified sources. The normal negotiation is published to attract, competitive proposals are prepared, and results of the award are made known publicly. Award is made in the best interest of the Government, considering price, delivery, quality of product, and other factors. In the case of the negotiated purchase or in a result of further negotiations with the firm or firms that submitted the most acceptable proposals.

General Instructions For Bidding (Under Formal Advertising)

Bids should be filed out, signed, and submitted in accordance with the instructions accompanying the invitation for bids. The strictest care must be used in verifying all names prior to submission of bids. In the purchasing office, Mistaken disclosure after the opening of bids can be very costly to the bidder since the bid as submitted becomes a binding contract upon award. In preparing a bid, the bidder must consider all conditions relating to materials, packing, packaging, and delivery, which may be

attached to the invitation for bids and may vary from the standard printed instructions.

Each bid which does not conform to the essential requirements of the Invitation for Bids will be rejected. All bids may be accepted by the contracting officer (1) when rejection is in the interest of the Government, or (2) when he finds that the bids are not reasonable, or were not independently arrived at in open competition, or are otherwise, or were submitted in bad faith. Neither independent nor alternative bids will be considered unless authorized by the Invitation for Bids.

Bids must be submitted in sufficient time to reach the designated office prior to the time fixed for opening. Bids that are submitted late have not bid opening are late bids and are given consideration only if received before award has been made and if the failure to arrive on time was due solely to a delay in the mails for which the bidder is not responsible. Bids received by the Government. It is important to offer sufficient proposals as purchasing officers will not accept mail on which postage is due.

Types of Contracts

The fixed-price contract is generally used for both formally advertised and negotiated procurements. Variations of the fixed-price contract are employed to provide for price indeterminacies when the performance of the contract may involve large contingencies or uncertainties in costs such as fluctuating production rates. Cost-plus-incentive-type contracts are awarded for certain limited situations and may be awarded with or without a fee. Cost-plus-a-percentage-of-cost contracts are prohibited by law. Letter contracts are preliminary contracts which enable a contractor to commence work pending the negotiation and negotiation of a formal contract. They are used only as emergency or under unusual circumstances requiring immediate initiation of procurement activities.

Payment of Invoices

Payments are made in accordance with the provisions of each contract. Invoicing and payment delays of contracts must be read carefully to make sure that invoices are properly controlled and that they are submitted at the right time and in the right office. Government regulations, which protect the taxpayer, require that the

contractor submit a bill that is accurate in all respects. When obligations under the contract are fulfilled and amounts properly incurred, the contractor will be paid promptly.

Delay in payment of invoices may be caused by incorrect computations, failure to submit supporting receipts, inaccurate without exception, incorrect coding of line items on contracts, or other failure to comply with contract requirements.

Government Financial Assistance

Contractors are expected to be fully qualified and competent to perform the contract in all respects including financial. Some contractors may cause a significant drain on a contractor's working funds. That, it may be in the best interest of the Government to provide financial assistance. This assistance may take the form of a loan guarantee, progress payment, advance payments, or appropriate loans, a combination of two or more of them. A brief description of each type is set forth below. The descriptions are not complete and are recommended that specific financial problems be discussed with the contracting officer.

Guaranteed Loans, popularly known as "V" Loans, are loans made by private banks to contractors, repayment of which is partially guaranteed by a military department. Facilities have been established whereby the private bank of the contractor's choice may apply to the Federal Reserve bank of the district for the guarantee of the loan. The Federal Reserve bank may, at its discretion, conduct any necessary credit investigation and forward the application with a recommendation to the military department presently interested. The military department, after determining the eligibility of the contractor, may authorize the Federal Reserve bank to issue a guarantee of the loan as its behalf. The loan is made and administered by the lending bank. Guaranteed Loans are an especially suitable contract financing device for subcontractors.

Progress payments are preliminary payments based on a percentage of costs incurred: either of total costs or of direct labor and material costs.

Progress payments in construction, construction, shipbuilding, and ship repair are based on estimated percentages of physical completion. Progress payments, under contracts awarded by the Government, are made only if the invoice for bids provide for such payments. In negotiated pro-

cesses, contractors working progress payments should, in order to receive consideration, so notify the contracting officer when submitting proposals.

Advance payments are payments made to a contractor prior to and in anticipation of future delivery or other performance of a contract. Without certain exceptions, payments for advance payments will not be approved unless no other source of adequate financing is available to the contractor.

Subject to the above considerations, the need for reasonable progress payments or advance payments is not regarded as a hardship or advance factor in the awarding of contracts.

In addition, the Small Business Administration is authorized to grant loans to small business concerns to finance plant construction, acquisition of equipment, and supply working capital. Such loans may be made directly by the Administration in cooperation with banks or other lending institutions. The SBA provides a valuable service to small business by making available to them technical and managerial aids and publications in the fields of personnel management, organization, operations and maintenance of equipment, and opportunities for developing and selling new products.

Inspection and Quality Control

Before material can be accepted and paid for by the military departments, it is usually inspected by a representative of the Government to determine if it conforms to all aspects to the requirements of the contract. The place of inspection is provided for in the contract and generally will be either (1) the place of manufacture, (2) the point of delivery, or (3) destination. Inspection of components, subassemblies, and end areas does not relieve the contractor of the responsibility of meeting all contract requirements (including material specifications, packaging, and packing).

The increasing use of quality control techniques by industry is recognized by the military departments. Military inspectors who consider the use of such techniques by a contractor in determining whether Government standards are being met.

Rd, Performance, and Payment Bonds

Bid bonds accompany bids and represent a guarantee by authorized sureties that the bidder will, within the time specified, enter into a contract and give proper bond for its performance. Bid bonds are not required unless specified in the Invitation for Bids. They may be required by the

Government only when the contract to be entered into is to be supported by a performance bond or by performance and payment bonds.

Performance bonds assure the performance and fulfillment of all the terms and conditions contained in the contract. The Miller Act (40 U.S.C. 291-292), in effect, requires that performance bonds be furnished on construction contracts exceeding \$2,000 in amount to be performed within the United States. In view of the above considerations, the need for reasonable progress payments or advance payments is not regarded as a hardship or advance factor in the awarding of contracts.

Payment bonds insure the payment of all persons supplying labor and material in the prosecution of work provided for in the contract. Payment bonds are required in connection with performance bonds. Payment bonds are required on fixed price construction contracts exceeding \$2,000. On contracts other than construction, payment bonds are used only on government bonds awarded the contractor for bid or Request for Proposal will so state, together with the amount to be required.

Classified Contracts

A classified contract is any contract that requires or will require access to classified information by the contractor or his employees in the performance of the contract, even though the contract document itself may not be classified.

Contractors seeking to participate in classified work or subcontracts are required to take steps to be granted a facility security clearance in order to be eligible for such participation.

Action to deny a contractor's facility for participation in a given contract is initiated by contracting officers of the military departments. Requests for facility security clearance of subcontractors are initiated by the prime contractor.

Facility security clearance granted to a contractor is applicable to any prime or subcontract of equal classification or less and is binding upon all performing activities of the military departments as well as all Department of Defense prime contractors. In addition, all contractor personnel who require access to classified information must be granted personnel security clearances. Clearances remain in force as long as there is a need for such clearance. If a contractor is no longer needed for security reasons.

Complete procedures are contained

in the Department of Defense "Index and Security Manual for Safeguarding Classified Information." Copies of this manual are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., page 10, costs.

Specifications and Standards

Most supplies used by the military are purchased on the basis of Federal or military specifications which describe quality, size, performance, and other features of the item to be purchased and state requirements for inspection, testing, packaging, and packing. When the specifications for an item being purchased are not included in the Invitation for Bids, the contractor should apply to the contracting officer using the Invitation for Bids or to each other source as may be designated in the invitation for bids.

Index of military specifications and standards is available from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. These index list specifications by item and by number, and indicate the agency which the military department (and technical service or bureau).

Qualified Products Lists

Certain specifications contain a "qualification test requirement," which means that a manufacturer's product must have passed certain tests listed in the specification. Products which have passed the qualification tests are listed in the Qualified Products List (QPL) for that specification, and the manufacturer is assured that he will be allowed to compete for future procurements of the product.

When a product is purchased as included in a Qualified Products List, this will be so specified in the invitation for bids, and only those bids offering products which are on the list or have been approved prior to the time set for the opening of bids, but inclusion thereon can be considered.

The following criteria are considered in determining whether the qualification test requirement is to be included in a specification.

- The time required for testing after award would unduly delay delivery of the supplies being purchased.
- The cost of repetitive testing would be excessive.
- The tests would require expensive or complicated test apparatus not commonly available.
- The interest of the Government requires, in advance, prior to award, that the product is satisfactory for its intended use.

c. The documentation of acceptance would require performance data to supplement technical requirements contained in the specifications.

Where a Qualified Products List is established, manufacturers are encouraged to submit samples of their products for test and approval. The list, as in the GPO, since the lists are always open for inclusion of products from additional sources. Such specifications requiring qualifications contain instructions for the submission of products for such testing.

Agents or Contractors' Representatives

It is not necessary to employ any person or selling agency to obtain Government business, although some concerns do in. Some life insurance companies are permissible. The "Covered Agent/Contractor/Fac" clause, which is included in all defense contracts, is a warranty by the contractor that it has not employed or retained any person or selling agency "to solicit or secure this contract upon an agreement or understanding for a commission, percentage, kickback, or consideration of any kind." However, the clause also provides that bona fide employees or bona fide established commercial or selling agencies maintained by the contractor for the purpose of securing business, even though paid on one of the above bases, may properly represent a firm in obtaining Government contracts. Receipt of the warranty contained in the contract may result as an inducement to the contract or the recovery by the Contractor of the amount of the fee paid.

Inquiries will be made of, and written representations will be obtained from, prospective contractors as to whether they, their employees or retained agents or company or person (other than a full-time employee working solely for a prospective contractor) to solicit or secure the contract, and the contractor shall agree in writing to furnish information relating thereto as may be required by the contracting office. DD Form 119 is used as a basis for obtaining this information, and a copy of this form may be obtained from any military contracting office.

Gifts/Bribe

Certain practices that may be considered as private business, such as offering gifts or granting gratuities and favors, must be avoided in dealing with the Government. Military procurement is subject to the provisions of public law which prohibit the offering of such gratuities to, or the accept-

ance by, Government personnel charged with the responsibility of negotiating or administering Government contracts. Violations may result in criminal prosecution, and, under the provisions of the "Gratuities" clause incorporated in defense contracts, in the termination of the contract.

Non-discrimination in Employment

When entering into any contract involving the employment of labor, it is the Government's policy to include a provision obligating the contractor not to discriminate against any employee or applicant for employment because of race, religion, color, or national origin. The clause imposes upon the contractor the responsibility for reducing the provision to most subcontractors. It is the contractor's and, in appropriate cases, the subcontractor's contractual obligation to maintain a labor policy consistent with the requirements of this provision.

Definition of Small Business

For these procurements in which preferential treatment of bids from small business concerns are authorized by the Department of Defense, a bidder must conform to the small business definition in order to receive preference. Congress has given the Small Business Administration the sole authority for the determination as to what concerns shall be considered small business. One of the following definition of "small business" or possession by a governmental agency in the Department of Defense.

General definition. A small business concern is a concern that (1) is not dominant in its field of operation; (2) is not a subsidiary of a larger firm; (3) is not a subsidiary of a firm having more than 500 employees; or (4) is certified as a small business concern by SBA.

Dominance in field of operation. A concern is "not dominant in its field of operation" if, in writing, it does not exercise a controlling or major influence in an area of business activity. In determining whether dominance exists, consideration shall be given to all appropriate factors including volume of business, number of employees, financial resources, competitive status or position, ownership or control of materials, processes, patents and license agreements, sales territory, and business assets.

Affiliates. Business concerns are affiliates of each other when either directly or indirectly (1) one concern controls or has the power to control the other, or (2) a third

party controls or has the power to control both. In determining whether concerns are independently owned and operated, no account is taken of stock ownership or net dilution events, consolidation, or other corporate reorganizations, common ownership, common management, and contractual relationships.

Number of employees. In connection with the determination of small business status, except in SBA otherwise definitions is a particular industry or part thereof, "number of employees" means the average employment of any concern and its affiliates based on the number of persons employed during the pay period ending nearest the 15th of the 3d month of each calendar quarter for the preceding four quarters. If a concern has not been in existence for four full calendar quarters, "number of employees" means the average employment of such concern and its affiliates during the period such concern has been in existence based on the number of persons employed during the pay period ending nearest the 15th of each month.

Dealer as small business concern.

A dealer who markets bids or offers in its own name, but who purports to furnish a product not manufactured by itself, shall be considered to be a small business concern when, in addition to meeting the general definition, it agrees to furnish as the performance of the contract, products manufactured or produced in the United States, its territories or possessions by small business concerns.

Small business certificate. A small business certificate is a certificate issued by SBA pursuant to the authority of the Federal Acquisition Regulation, 201 and 212 of the Small Business Act of 1953, as amended, certifying that the holder of the certificate is a small business concern for the purpose of Government contracting and is in compliance with the terms of the certificate.

Contracting office accept at face value. (a) A small business certificate issued by the SBA, or (b) a written statement by the contractor that it is a small business concern in accord with the above definition. In the event such a statement is questioned prior to award of the contract, the contracting office will refer the matter to the SBA for a ruling, and this ruling will be accepted as final.

Any change in the definition of small business will be published by the SBA in the Federal Register, and business firms desiring current information of their status as small business

should contact the nearest regional office of the SBA.

Special Small Business Preference Provisions

Each military department has an active and continuing program to shield small business concerns from the competitive bidding process for defense procurement. In addition, concerns certified as small business are granted certain preferential treatment in some instances in the award of military contracts. Solicited procurements may be set aside in whole or in part for exclusive participation of small business.

In the case of equal low bids submitted by a large concern and a small business concern, preference is awarded to the small business. However, if the large business concern will perform the proposed contract in or on at substantial labor savings, it may receive preference over a small concern which will not perform the contract in a surplus labor area. If equal low bids are submitted by a small business concern and a large business concern, both of which bid to perform the proposed contract in or on at a labor surplus area, preference is awarded to the small business concern.

Union With the Small Business Administration

The military departments work closely with the Small Business Administration to maintain a cooperative program to increase small business participation in defense procurement. SBA representatives, who are contracting officers jointly, assess and select procurements that can be set aside for exclusive small business participation. The Administration has also the authority to certify the competence of a concern or concern of concern of low small business bidder or offers whose competence on a particular procurement is being questioned by the contracting office. Such certification is made by the SBA in cooperation with the contracting office. The SBA retains military department bid/let and end-on to do or to do or additional potential small business suppliers for such lots.

Subcontracting

Many small firms seeking defense work find it advantageous to integrate subcontracting possibilities. These concerns may derive of defense products, such as aircraft, and combat vehicles, which products are awarded to the production facilities of small firms. This does not exclude small business firm participation in such procurement programs. However, 35 SBA offices of the Department of

contracts is performed by small firms as subcontractors and suppliers. To insure that small business concerns are given to small business concerns as potential subcontractors, each franchise and cost-plus-incentive-type contract is given of \$5,000 contains a contractual clause requiring the prime contractor to notify the small business personnel of the availability of small business concerns as subcontractors. Specific procedures to be followed by concerns interested in obtaining military contracts are contained in the Army, Navy, and Air Force sections of this publication. Subcontractors are selected by the prime contractor and deal directly with them, rather than with the Government. However, the Army, Navy, and Air Force have made agreements with their larger contractors wherein such contractor conducts a program designed to provide small business concerns with an equitable opportunity to compete for subcontracted work orders for items within their capability. This is known as the Defense Small Business Subcontracting Program, and it has been entered into not only by the prime contractors, but also by the military departments but by many of their major subcontractors in view.

No subcontract concerns should apply directly to the prime contractor, furnishing information on plant facilities, production capacity, product products, personnel, and financial assets. The names of major prime contractors are listed in the Department of Commerce, Small Business Administration, and other sources. Government or contract administration offices are also able to assist in locating subcontracting opportunities.

The Army, Navy, and Air Force sections of this publication contain information on the assistance available to small concerns interested in becoming subcontractors or suppliers.

Synopsis of Proposed Procurements

From Monday through Friday of each week, there is published in *Clasp* by the Department of Commerce, the "84 report of U. S. Government Procurement, Sales and Contract Awards." Individuals and interested business firms may subscribe to this publication for \$5 per year. A check or money order payable to the Treasurer of the United States should be marked to the U. S. Department of Commerce, Administrative Services Office, Room 1300, New Post Office Building, 435 West Van Ness Street, Chicago 7, IL. The Synopsis is also available in microfilm in each of the 35 SBA offices of the Department of

Commerce and at approximately 700 cooperating offices including some offices of the Government. Also available are classified proposed procurements of the purchasing agencies of the Department of Defense whether being processed by formal advertisement or by negotiation. As noted, these are, that published in the Synopsis, lists of concerns in excess of \$25,000 that have been made. Other information of value to the prospective contractor or subcontractor will be found in the publications.

Procurement Information Office

If the supplies or services which a firm is qualified to furnish are not listed in the Synopsis and the information cannot be obtained in the local area, an inquiry should be addressed to the Central Military Procurement Information Office, Office of the Assistant Secretary of Defense (Supply and Logistics), Department of Defense, 2215 Wilson Boulevard, Arlington 22201. That the information in 1949 is the Secretary of Defense is not in a public review to businesses in these dealings with the military departments and can assist in locating the prime contractor. Such information is of several and of wide application in the Washington area with the persons in the military departments who can best name specific concerns.

The Procurement Information Center, Room 712, Old Post Office Building, 15th Street and Pennsylvania Avenue NW, Washington 25, D. C., contains copies of all financial information, including bid and contract awards, from Army, Air Force, and Navy procurement activities.

Research and Development

The Department of Defense benefits from the research and development of American industry, education in industry, and nonprofit research in government, by obtaining through research and development contracts, active research and ideas necessary to its present and future requirements.

The Army, Navy, and Air Force are fully aware of the importance of locating and utilizing facilities in scientific research and development organizations. Each recognizes that such competence is not necessarily determined by the size of the organization and has established programs and procedures to assure that all organizations, regardless of size, are given the opportunity to submit research and development proposals. Contracts are awarded to those firms which have the highest competence in the specific branch of science or technology required, and the most complete understanding of the particular work to be done.

Virginia

Gary Fleming, General, Insurance
 1000 N. W. 10th St., Suite 100
 Fort Lauderdale, FL 33304
 Tel. 352/466-1111
 Fax 352/466-1111
 E-mail: gary@fleming.com
 Gary Fleming, General, Insurance
 1000 N. W. 10th St., Suite 100
 Fort Lauderdale, FL 33304
 Tel. 352/466-1111
 Fax 352/466-1111
 E-mail: gary@fleming.com

Washington

Flight School	West	Elizabethtown, Kentucky	
Wt & L	Montgomery		
Telephone	East 2 (502)	Ext. 47-333	
Head Quarters	West	Waverly	
2000 N. E. 4th St.	West	Waverly, OH 44150	
Telephone	Area 4401	Ext. 541, 442	
Major Publishing Office			
William J. Thompson	Editor	Mark P. Poff	
John J. Poff			
Wt & L	Franklin		
Telephone	Area 4401	Ext. 441	
Major Publishing Office			
Wt & L	Franklin		
Telephone	Area 4401	Ext. 441	

RESEARCH AND DEVELOPMENT OPPORTUNITIES

The magnets of naval research and development contracts are awarded by the activities listed below. Interested firms should notify the appropriate activity of the specific research or development areas in which they are qualified, giving complete information on available facilities, past experience in Government and commercial work, qualifications of technical personnel and financial status.

[illegible]

Q101 (1) Seed samples (superior 11) from the
Madagascar 20. P. C.

DEPARTMENT OF THE ARMY

Ordinance Corps

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The following Clearance District Off.

ers are the proper points of contact for firms (within their respective geographic areas) seeking Ordnance Corps contracts. They have available for distribution copies of all invitation for bids issued by the purchasing office and maintain current bid-dead lists of firms within their district.

[illegible]

Signal Corps

Emergency Contact: U. S. Army Signal Corps Supply
 Agency, 200 South 18th Street, Philadelphia 3, Pa.
 From the public communications center for
 your National Security Area (NSA) (except
 telephone and teletype service)
 Emergency Officer, Laboratory Assurance Office
 Signal Corps Supply Agency, Fort Monmouth, N. J.
 (except for maintenance)

The following Signal Corps offices are either offices which process plaintext to accomplish their own mission or are decentralized offices of the U. S. Army Signal Supply Agency, a primary purchasing office, which handle or administer similar procurements:

[illegible]

RESEARCH AND DEVELOPMENT PROJECTS

Research and development work is performed under the supervision of the technical services of the Department of the Army. Organizations working information leading to research and development contracts should direct their requests to the technical service that has responsibility for the particular item or service. Addresses of the technical services are listed in *Section 2*.

Chief Dental Officer, Building 77, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Dentistry, Room 184, St Ann's, West London, W12 9LJ. Tel: 0181 734 1111.

Chief Medical Officer, Room 20-214, The Postgraduate Medical School, 11 St Andrews Place, London N1 2RY. Tel: 0181 275 3111.

Chief of Transportation, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Operations, Building 77, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Administration, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Finance, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Information, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Security, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Quality Assurance, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Compliance, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Risk Management, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Environmental Health, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Fire Safety, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Waste Management, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Facilities Management, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Human Resources, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Information Systems, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Legal Services, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Procurement, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Supply Chain Management, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Customer Services, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Marketing, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Communications, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Public Relations, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Media Relations, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Corporate Social Responsibility, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Sustainability, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Diversity & Inclusion, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Equality, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Access, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Reasonable Adjustments, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Patient Safety, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Clinical Governance, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Quality Improvement, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Patient Experience, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Patient Engagement, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

Chief of Patient Participation, Building 219, Drury Park, Wexham, Bucks HP8 9AB. Tel: 0494 511111.

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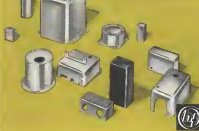
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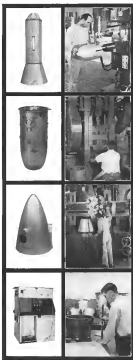
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A) 100°F B) 110°F C) 120°F



2. Exhaust gas temperature of a military engine at 100°F

A) 100°F B) 200°F C) 300°F



3. Average surface temperature of a 50-watt incandescent light bulb

A) 100°F B) 200°F C) 300°F

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4. Average cylinder head temperature of a 200-hp aircraft engine at 100°F

A) 100°F B) 200°F C) 300°F



5. Average boiling temperature of a bowl of soup at 100°F

A) 100°F B) 200°F C) 300°F



6. Mean skin temperature of a person at 100°F

A) 100°F B) 200°F C) 300°F



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Through such company designed research and development, Rohr offers designers and the aircraft industry standard materials equal to the demands of modern and future flight. And, thereby, secure Rohr Aircraft Corporation a strong competitive position in the years ahead.



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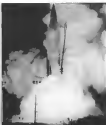


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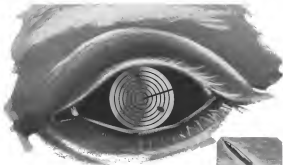
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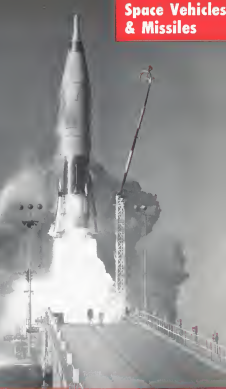
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For technical information on M6T-600-4V or other titanium alloys, write to: Aero-Space & Missile Development Dept., Mallory-Sharon Metals Corporation, Niles, Ohio.

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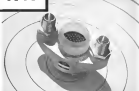
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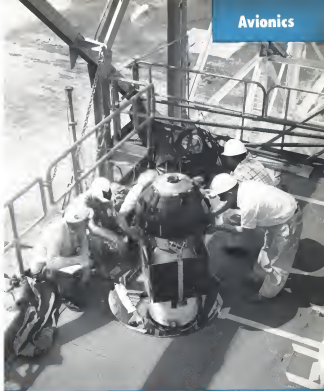
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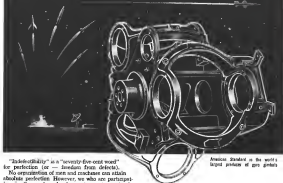
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142



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"Idiosyncrasy" is a "seventy-five-cent word" for perfection (or — freedom from defects).

No organization of men and machines can attain absolute perfection. However, we who are participating in Space Age developments must consistently strive to do better than has ever been done before. Tolerances which couldn't even be measured ten years ago must be met in production today.

As a manufacturer of components for inertial guidance and navigational aids systems, we have met and conquered the most exacting demands that can be made on men and machines.

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American Standard is the world's largest producer of men's umbrellas.

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All Generated From a Single Compact Control Panel

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See page 88C under On Words as far literature



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HONEYWELL OFFERS A COMPLETE LINE OF INERTIAL COMPONENTS

... to meet the need of all applications

RATE GYRO

TYPE M-100 miniature rate gyro contains constant damping over a wide operating temperature range without the use of heaters. The typical damping of 4 to 6 "DPS" is obtained without benefit of heat from the spin motor, and a hold virtually constant up to a temperature of 125°F. The gyro spin motor will run on one (right) face or three phase power, and is isolated from ground by means of insulating ground currents. Write to Aero Division for Bulletin M-100.



- Full Scale Range: 1 to 400 degrees/sec
- Threshold Resonance: less than 0.01 degrees/sec
- Accuracy: less than 0.1% of full scale to 1% range, less than 0.1% of full range
- Damping: 4 to 6 "DPS" to "40" to "120"
- Shock and Vibration: Acceleration to 150 G
- Vibration: 50 G to 3000 cps
- Size: 3" diameter, 2 1/2" long
- Weight: less than 6.5 ounces

TYPE GMA "Golden Circle" is a full production rate gyro with a wide variety of different models and has been proven in operational service during the past two years. Because of its small size and high performance it has been successfully used in a number of various rate packages. Type GM is still proof for improved computer resistance and noise, hermetic sealing. Write to Aero Division for Bulletin GMA.



- Full Scale Range: 1 to 400 degrees/sec
- Threshold Resonance: 0.01 degrees/sec
- Accuracy: 0.1% of full scale to 1% range, within 2% to full range
- Damping: Fluid damped, temperature compensated
- Shock and Vibration: Acceleration to 100 G
- Vibration: 50 G to 3000 cps
- Size: 1" diameter, 3 1/2" long
- Weight: 3.5 ounces

TYPE JR is particularly well suited for those applications where proven reliability must be combined with high performance. A unique quadrature output suspension system high sensitivity and a wide full scale range under severe environmental conditions. The Type JR gyro is available with heaters for those critical applications requiring constant damping over the entire operating temperature range of the instrument. Write to Aero Division for Bulletin JR and JRT.



- Full Scale Range: 1 to 1000 degrees/sec
- Threshold Resonance: less than 0.01 degrees/sec
- Accuracy: 0.05% of full scale
- Damping: JR: 0.5 to 1.0 from "30" to "120"
- JRT: 0.5 to 4.0 from "30" to "120"
- Shock and Vibration: Acceleration to 100 G
- Vibration: 10 G to 3000 cps
- Size: 2" diameter, 4 1/2" long
- Weight: 1.8 lbs

GG79 is a derivative of the HG 7901 rate gyro and incorporates an advanced design and design features which adapt it to far more rugged applications. A wide selection of minimum turn to rates, compensation resistance and damping ratios is available. The GG79 meets MIL-8-5372 requirements. It is available with one or two potentiometers. With a single potentiometer a rate which operating is a predetermined ranging rate can be included. Write to Aero Division for Bulletin GG79.



- Power Requirement: 115 volts, 400 cps, single phase
- Performance: Resolution: Available in any size from 420 ohms to 15,000 ohms
- Threshold Resonance: 0.1 degrees/sec at 100 cps
- Supply Line: 5 millivolt maximum
- Ambient Temp. Range: -45°F to 142°F
- Size: 4" long, 3 1/2" wide, 2 1/2" high
- Weight: 1.25 lbs

LOW COST GAS DRIVEN GYRO

GG99 is an expensive, low-cost self-exciting 2 rate gyro designed for single shot, short-run use under high shock, vibration, and acceleration loads. A cylinder of compressed gas extends the range and extends the gimbals within 100 milliseconds after firing. The GG99 has less than 40 parts, is designed to weigh not 100 G shock loads and 20 G vibration exposure. Shipped a military specification even all produced reliability of 9.998. Write to Aero Division.



- Warmup and settling time: less than 100 milliseconds
- Def: 0.5 degrees per minute
- Output rate: freedom-floated
- Line with freedom-floated: 145 degrees
- Size: 4 1/2" long, 2 1/2" diameter
- Weight: less than 6 lbs

For technical literature write to Aero Division or Aero Division as indicated.

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2 AXIS GYRO

GG44 FULL FREEDOM GYRO is a hermetically sealed, two-axis, full freedom gyro. It is characterized by stability results from the mounting of a constant 3-degrees-of-freedom gyro on a third zero-drift gyro which maintains perpendicularity between the two gimbals extending ranging and gimbals. It features solid state circuitry in a single package in light weight, low cost and is ideal for use in any application requiring a high level of accuracy. Available in both synchro, potentiometer or both. An electronic-chanical sealed fluid system provides reliable alignment of all three gimbals from any position during power warmup. Write to Aero Division for Bulletin GG44.



- Power requirements: 115 volts, 400 cps, 3-phase
- Zero output: 10 minutes zero output
- Gimbal freedom: 360 degrees at both longitudinal and transverse axis
- Total output at average time: 1 minute maximum
- Resolution: 0.2 to 4 degrees/min. (depending on input)
- Free drift rate: average is within 0.20 deg/min (corrected for non-zero output rate)
- Accuracy: 0.15 degrees is better than zero verified with zero output
- Size: 8 1/2" long, 5 1/2" wide, 5 1/2" high
- Weight: Approx. 9 lbs including amplifier and potentiometer assemblies

GG46 RAM gyro has been specifically designed to withstand the severe environmental stresses encountered in rocket and missile applications. Power less than 100 mW, full monogamous gimbal resistance and complete hermetic sealing combine to insure high reliability and consistent operation under extreme vibration and acceleration loads (without a mode change). Hermetically sealed tests have proved reliable operation under shock loads up to 40 G. Write to Aero Division for Bulletin GG46.



- Power requirements: 100 volts, 400 cps, 3-phase
- Warmup time: 30 seconds
- Performance: 0.15 degrees at rates up to 15 deg/min
- Gimbal system: 360 degrees at both axes in vertical up to 15 deg/min without external amplifiers
- Shock: 100 g shock up to 80 G shock - meets all performance requirements of MIL-8-5372A
- Size: 3 1/2" long, 4 1/2" wide, 4 1/2" high
- Weight: 4.3 lbs

FLOATED GYRO

GG44 MCG (Minimum Drifting Gyro) contains small size and light weight with high accuracy. It is a single degree of freedom gyro with fluid gimbals and a constant 3-degrees-of-freedom gyro on a third zero-drift gyro which maintains perpendicularity between the two gimbals extending ranging and gimbals. It features solid state circuitry in a single package in light weight, low cost and is ideal for use in any application requiring a high level of accuracy. Available in both synchro, potentiometer or both. An electronic-chanical sealed fluid system provides reliable alignment of all three gimbals from any position during power warmup. Write to Aero Division for Bulletin GG44.



- Power Input: 24 volts, 400 cps, 3-phase direct and rate fixed both
- Accuracy: resolution: 1 deg/100 lines/mil resolution maximum, 0.05 deg/min resolution maximum, 0.05 deg/min resolution maximum
- DSI rate: 0.25 degrees per minute (corrected)
- Shock: 100 g shock up to 80 G shock - meets all performance requirements of MIL-8-5372A
- Size: 3 1/2" long, 4 1/2" wide, 4 1/2" high
- Weight: 4.3 lbs

MCG-AMCG MCG family, only slightly larger than the standard MCG, provides a small gyro with an output signal freedom up to 100 degrees. Because of this wide angle freedom it is particularly adequate in strapped down attitude reference systems, rate packages and fire control systems. The wide angle MCG also has a permanent fluid gimbals which allows ranging rates up to 8000 degrees per hour. Write to Aero Division.



- Power Input: 24 V, 110 V, 30, 400 cps
- Torque generator: 100 lines/deg, 400 lines/deg
- Size: 4 1/2" long, 4 1/2" wide, 4 1/2" high
- Gimbal freedom: 18 degrees
- Input range: maximum 2 m
- Operating temperature: 100°F to 500°F
- Size: 3 1/2" long, 3 1/2" diameter
- Weight: 2.5 lbs

GG37 GYRO is an advanced version of the Hermetically Sealed Gyro. It is a small, multi-part, single-degree-of-freedom gyro specifically designed for inertial platform attitude reference applications and features a permanent magnetic output. Performance figures, though presently classified, are available on a need-to-know basis. Write to Aero Division.



- Power requirements: 115 volts, 400 cps, 3-phase
- Zero output: 10 minutes zero output
- Gimbal freedom: 360 degrees at both longitudinal and transverse axis
- Total output at average time: 1 minute maximum
- Resolution: 0.2 to 4 degrees/min. (depending on input)
- Free drift rate: average is within 0.20 deg/min (corrected for non-zero output rate)
- Accuracy: 0.15 degrees is better than zero verified with zero output
- Size: 8 1/2" long, 5 1/2" wide, 5 1/2" high
- Weight: Approx. 9 lbs including amplifier and potentiometer assemblies

LINEAR ACCELEROMETERS

TYPE LA-500 linear accelerometer is a permanent magnet device that instantaneously displays and linearly reports these instruments are fluid damped, and are designed to operate between -40°F and +175°F. These non-potential accelerometers are inherently insensitive to cross coupling accelerations, and are provided with mechanical stops to prevent diaphragm flexing against anvils beyond the specified range. *Write to Boston Division for Bulletin LA-500*

TYPE LA-600 is an A.C. Linear Accelerometer in which motion is translated to permit realization of extremely low level outputs. This unit operates of a non-potential seismic mass, supported by a piezoelectric spring suspension and undamped by an A.C. variable reluctance pickup. The accelerometer has an output impedance coupling for zero constant damping rate throughout its wide range of operating temperatures from -50°F to +150°F. *Write to Boston Division for Bulletin LA-600*

TYPE LA-700 accelerometer is a complementary unit to the LA-600 for those applications requiring a high full scale range combined with a low natural frequency. This linear accelerometer is a non-potential seismic mass, supported by a piezoelectric spring, incorporating compensated fluid damping, an A.C. variable reluctance pickup, and accurate reliable operation over a wide operating temperature range. *Write to Boston Division for Bulletin LA-700*

605A MPA (Miniature Production Accelerometer) designed as a companion unit for the MDC series of gyroscopes, offers the advantage of low mounting profile, high reliability, and a life expectancy of 50,000 hours. Special features include a multiple pulse outputting rate pickup with a piezoelectric magnet moving coil integrating element. Housed in a fully encapsulated EC0135 package and EC0134 amplifier-demodulator, specifically designed for use with the 605A, are also readily available to provide the user with a complete unit. *Write to Boston Division for Bulletin 605A*

For information on how the Military Products Group can best serve your needs, contact the Regional office nearest you.

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- Full Scale Range: 11 to 140 G
- Drift: 0.001 G
- Piezoelectric Resistor: 1,000 to 14,000 ohms
- Operating Rate: 0.5 to 0.25 typical
- Natural Frequency: 1 to 10 cps
- Cross-Axis Sensitivity: 1% of full scale
- Shock: to 50 G
- Vibration: MIL-0-2071
- Size: 1 1/2" diameter, 3 1/2" long
- Weight: 1 lb.



- Full Scale Range: 11 to 140 G
- Full Scale Output: to 10 mV
- Shock: 0.001 G
- Operating Rate: 0.5 to 0.25 typical
- Natural Frequency: 1 to 10 cps
- Cross-Axis Sensitivity: 0.001 to 0.01 maximum
- Shock: to 50 G
- Vibration: 10 G to 1000 cps
- Size: 1 1/2" diameter, 3 1/2" long
- Weight: 1 lb. maximum



- Full Scale Range: 11 to 140 G
- Full Scale Output: to 10 mV
- Shock: 0.001 G
- Operating Rate: 0.5 to 0.25 typical
- Natural Frequency: 1 to 10 cps
- Cross-Axis Sensitivity: 0.001 to 0.01 maximum
- Shock: to 50 G
- Vibration: 10 G to 1000 cps
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- Size: 1 1/2" diameter, 3 1/2" long
- Weight: 1 lb. maximum



DESIGNED TO
MEET YOUR
SPECIFICATIONS

CUSTOM DESIGN Data for all units shown in this folder are nominal. Variations in specifications can be made to suit the application. Honeywell also manufactures instruments designed by others.

Honeywell

Military Products Group



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TELEMETRY SYSTEMS ENGINEERING



Automatic telemetry systems are available for all types of data. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign.



Mobile telemetry systems are available for all types of data. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign.



Ground telemetry systems are available for all types of data. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign.



Space telemetry systems are available for all types of data. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign.

DATA RECEIVING & HANDLING SYSTEMS



These systems are available for all types of data. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign.

SPECIAL PURPOSE TAPE RECORDING



These systems are available for all types of data. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign. They can be designed to operate in a wide range of environments, from the most severe to the most benign.

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BUILT IN RELIABILITY* BY FAIRCHILD

RATE GYROS—Fairchild's Subminiature Fiberoptic Rate Gyros (2 1/2" dia. x 2" long) will take 150g's of shock and 50g's at 2000 cps vibration even for rates as low as 10 per second. Model RG-100 has fully controlled damping with $\pm 15\%$ from -40°C to 200°F ; Model RG-101 has partially controlled damping for those applications which require operation over a smaller temperature range.

ACCELEROMETERS—Fairchild's line of continuous measure linear accelerometers on the $\pm 1/2$ to $\pm 50\text{G}$ range, with natural frequencies from 5 to 175 cps depending on G range. Miniature Model TA-400 (1 1/4" dia. x 1 1/2" long) has a sensitive a.c. pick-off, withstands 100G shock and 50-2000-cps at 20G vibrations and has a 0.5% accuracy. Model TA-100 has a pot pick-off available with linear or non-linear outputs.

POTENTIOMETERS—Fairchild's High Reliability Potentiometers can be had in 16" to 5" diameters, single and multi-turn, linear and non-linear, in standard and high temperature versions and with linearity as high as 0.005%.

PRESSURE TRANSDUCERS—Fairchild's Precision Line of Pressure Transducers include both bonded tube and capsule diaphragm types for measuring pressure from 1 to 10,000 psi absolute, gauge, or differential. Also enclosed case version for absolute measurements of corrosive fluids. Standard units have pot pick-off; a c type pick-off is available on special order. All designs withstand 2000 cps 25G vibration and 50G shock.

For more information regarding Fairchild Pressure Components call the nearest Fairchild office or write Fairchild Controls Corporation, Dept. 377.

*Based on MIL-STD-883C Method B, Class A, for Reliability in Potentiometers

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ANNOUNCING A NEW DEVELOPMENT BY BENDIX



FOR TURBINE ENGINES

Provides a continuous condensed display of turbine engine vibration and temperature conditions

A landmark in engine instrumentation progress is the Bendix® Temperature-Vibration Monitor which simultaneously displays the findings of 40 temperature and 8 vibration sensors strategically located on all 8 cylinders of a turbine powered aircraft. This data is presented on the flight deck of the aircraft in bar graphs form so that it can be continuously monitored and easily read.

The average displacement of 8 vibration packages is displayed continuously on the lower vibration ray tube with the top of the bar graph indicating vibration displacement on the right scale. This continuous conditioning of vibration continuously reduces excessive turbulence on the jet engine.

The temperature analysis normally associated with the exhaust gas thermocouples will locate faulty burners, fuel distribution disturbance and plugged nozzles or any unusual hot or cold

conditions around the turbine engine exhaust. The temperature display in the "all" position presents maximum and minimum temperatures on the upper vibration ray tube continuously for the four engines in vibration in a temperature column set up by the operator. The individual engine temperatures can be displayed in 10 bar graphs whose deflection can be read on the tube scale in deflections above or below the temperature datum, and individual degrees may be accurately and easily read from the digital read-out.

The equipment, available developed for RO-4C, is applicable to all turbine and suitable turbine powered aircraft. The equipment for the four engine installation is approximately 30 lbs. and includes the Temperature-Vibration Monitor pressure/altitude and a remotely mounted 1/2 ATR short box.

FAIRCHILD



Vibration indicator for four engines with four and four pickup on each flight deck display and rates total vibration displacement.

Temperature "all" display indicating maximum and minimum temperatures above and below temperature datum for four engines.

Temperature for single engine indicates all thermocouples indicating temperature above or below temperature datum reference.

Scintilla Division
 BENTLEY NEW YORK



Circle Number 175 on Reader Service Card

Model 100 to 1000 watts - 50 to 100 kHz
 The Model 100 series of vacuum tube rectifiers, power diodes, and special semiconductor devices are available in a wide range of power ratings and frequencies. They are designed for use in a wide range of applications, including power supplies, signal processing, and test equipment. For more information, contact International Rectifier Corporation, 2300 Zanker Road, El Segundo, CA 90245.



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and 1N5457 axial lead silicon diodes, and JAN 1N213, 1N254 and 1N255 axial mounted silicon power diodes. Select the exact unit for your needs from the broad International Rectifier line. For details on any of the devices listed, contact our Military Sales Department, or the nearest International Rectifier Corporation sales representative.



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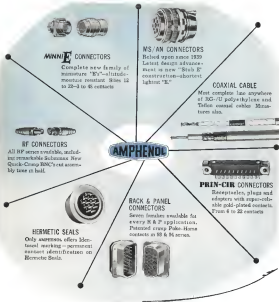
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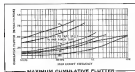
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The AR-200 is available for either $\frac{1}{2}$ inch or one-inch tape. It records 7 analog or 8 digital traces on $\frac{1}{2}$ inch tape. For one-inch tape it provides 14 analog, 16 or 32 digital, or a combination of 7 analog and 16 digital traces. It operates at six standard speeds from 1 1/2 to 60 ips. Power requirement in standard aircraft 28-volt DC. Converters are available for other power sources. Accessories include servo speed control, remote control and test unit, making the AR-200 a completely engineered system for airborne data acquisition. For complete specifications write for the Amplex AR-200 brochure.



Direct Record Amplifier

Frequency response (of Direct Record Amplifier output): ± 1 db from 50 to 80,000 cps, ± 1.5 db from 80 to 100,000 cps at a constant power of 20V. From 50 to 200,000 cps ± 3 db throughout in ambient temperature range of 0°C . to $+50^{\circ}\text{C}$.
Signal-to-noise ratio: 35 db down at normal operating level (for 100-ops signal).
Input impedance: 50K ohms, unbalanced to ground.
Input level: 1 volt RMS for normal record level; from 1.5 to 10 volts RMS accepted without significant performance change.
Harmonic distortion: $\leq 1\%$ at 100 ops at 20 cps.
System grounding: Drive 25 db between any two adjacent tracks.

FM-Garrier Record Amplifier

Frequency response: ± 1 db from 100 to 10,000 cps at 60 cps.
Noise: 34 db down at 45 db down at normal operating level.
Harmonic distortion: Less than 0.5%.
DC drift: Less than 1% per week peak-to-peak of center frequency.
Input impedance: 100K ohms, unbalanced to ground.
Input level: 0.7 volts RMS (continuous) for 40% distortion of FM carrier signal.

PDM Record Amplifier

Pulse accuracy: ± 2 microseconds at 30 cps.
Pulse length: 50 to 700 microseconds at 30 cps.
Input impedance: 10K ohms, unbalanced to ground.
Input signal: Normal ± 1 volt RMS (pulse and decay) plus no more than 1 microsecond ± 1 to ± 2 volt RMS (decay time 1 microsecond per volt).

Digital Write Amplifier

Input impedance: 10K ohms, unbalanced to ground.
Input level: ± 5 volts maximum, direct-coupled, referred to GND.
Transfer rate: Up to 15,000 bits/second.

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GR-H4

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- Null effect during vibration up to levels of 30 G's, over the frequency span of 0 to 2000 cps, or less than 0.015"/sec/G.
- There is no degradation of performance due to vibration up to 30 G's which is 100 G's.
- GR-H4 linear acceleration sensitivity over the entire temperature range $< 0.01\%$ /sec/G.

The characteristics of these units, with respect to natural frequency, sensitivity, damping, and pickup or motor excitation, may be modified to match most individual requirements for hardware compatible with system functions. Write American-Standard, Military Products Division, Norwood, Massachusetts.

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in heat control systems

Extremely compact proportional and on/off-type heat control systems from Magnetic Controls Company are accurate to within 0.1°F and are available in models to handle a wide variety of output requirements. Typical applications include gyms, medical platforms, jet aircraft, windtunnel air-flow and sea-lapping systems, aircraft cabins, and guidance shipping containers.



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in static inverters

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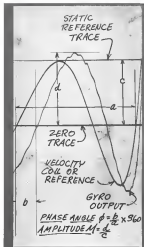
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185

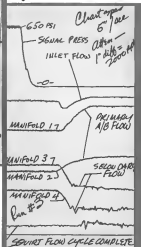
These are records of leadership in



Whitaker Gyro Division of Telecomputing Corp., Van Nuys, Calif., makes precision, rapid rate records of production gyros. In these tests the Visconder compares controlled angular velocities to a reference base on simultaneously recorded variables.

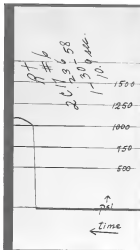
As aircraft operate at ever-faster supersonic speeds and as missiles fly farther into outer space, a baffled problem of configuration, configuration, pressure, timing, stress—and telemetry, double the art of measurement. The Honeywell Visconder directly records these and hundreds of other transients that flee through time at rates up to 8000 cycles a second. These records show only a few of the uncaptured ways in which the Visconder is leading the way to refinements on aircraft and spacecraft.

A Visconder charts performance of a valve in the tail assembly of a jet airplane for the Parker Hannifin Corporation of Cleveland, Ohio.



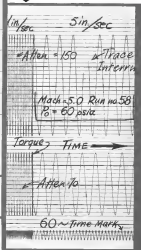
space/aeronautics research

These Visconder studies of aerodynamic damping conditions on an airframe were made at the AEDC Gas Dynamics Facility at Tullahoma, Tennessee, by ARCO, Inc.



ARCO Chemical Corporation uses the Visconder to chart the consistency of pressures during the burning cycle of a solid-propellant jet aircraft motor engine during production testing at the Stennis, Ind., plant.

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REFERENCE DATA: Write for Visconder Bulletin 9208 and 9212

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AC Generators



AC Voltage Regulators and SYSTEM COMPONENTS



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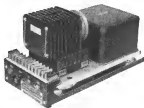


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